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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,576	04/09/2004	Heng-Chih Lin	TI-36613	1887

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EXAMINER	
WAMSLEY, PATRICK G	

ART UNIT	PAPER NUMBER
2819	

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H/A

Office Action Summary	Application No.	Applicant(s)	
	10/821,576	LIN ET AL.	
	Examiner	Art Unit	
	Patrick G. Wamsley	2819	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 13-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 13-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-10 and 13-20 have been considered but are moot in view of the new grounds of rejection.

Specification

The disclosure is objected to because of the following informalities:

Page 1, ¶2: Change "digital data is" to -- digital data are --.

Page 1, ¶3: Change "filter lowers" to -- filter lowers the --.

Page 1, ¶4: Change "freq is high" to -- frequency is high --.

Page 4, ¶21: Change "re-construction" to -- reconstruction --.

Page 5, ¶24: Change "current from" to -- currents from --.

Page 6, ¶30: Change "data is input" to -- data are input --.

Page 8, ¶40: Change "at least without" to -- without --.

Appropriate correction is required.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-10 and 13-20 are rejected under 35 U.S.C. 102(e) as being anticipated by the 2003 IEEE article, "Single-Side-Band Digital-to-Analog Converters for Nyquist Signal Generation" to Jurgen et al, hereafter Jurgen.

As depicted in Fig. 2, Jurgen discloses an arrangement for providing a reduced harmonic content output signal [$I_1 + I_2$] that represents a value of a digital input signal [input to DAC 1 and DAC 2], comprising plural storage devices [not shown in Fig. 2, but required to hold the signal prior to sampling: col. 1, line 12] configured to sample and store the digital input signal at different respective phases of a clock signal; plural current steering DACs [DAC 1 and DAC 2] configured to receive respective stored digital signals from respective storage devices and to provide respective currents [I_1 and I_2] that represent the stored digital signals; and an arrangement configured to combine the currents [$I_1 + I_2$] from respective DACs, so as to provide the reduced harmonic content output signal [$I_1 + I_2$] that represents the value of the digital input signal. Claim 17 restates the apparatus limitations of claim 1 in method format.

For claim 2, Fig. 2 of Jurgen depicts exactly two current steering DACs.

For claims 3 and 18, Jurgen uses two complementary clocks. Therefore, the two clock phases are substantially 180 degrees apart, having a substantially even distribution in phase, because they are complementary.

For claims 4 and 19, while Fig. 2 only depicts two DACs having two clocks, Jurgen's results can be extended to more than two clocks [page 95, col. 1, line 2].

For claim 5, extending Jurgen's results to more than two clocks would require substantially equal spacing, analogous to the complementary clocks of Fig. 2.

For claims 6-7, extending Jurgen's results to N clocks would involve N DACs.

For claim 8, Jurgen's DACs are configured to continually receive the digital input signal, including periods between clock phases, as shown in Figs. 3 and 4.

For claim 9, Jurgen adds the two output currents in Fig. 2 by tying them to the same node. This node functions as the claimed set of electrical connections.

For claim 10, Jurgen's technique suppresses images generated next to the digital signal, depicted in Fig. 1. Because these filtered images occur at high frequencies, Jurgen's DAC combination has a low pass filtering function.

For claim 13, Jurgen's arrangement, as shown in Fig. 2, does not contain an intervening LPF. The combination itself suppresses Nyquist image signals.

For claims 14-16, Jurgen's teachings are applicable to transmission systems, useful for sending a signal without also attaching mirrored images.

For claim 20, Jurgen's teachings are applicable to circuits, implemented by placing two converters on the same die [page 95, col. 2, line 4 and Fig. 8].

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,967,609 to Bicakci dynamically biases switching elements in a current-steering DAC. U.S. Patent 6,927,714 to Teterwak discloses a current steering DAC. U.S. Patent 6,909,390 to Khoini-Poorfard et al displays first and second current steering DACs. U.S. Patent 6,720,898 to Ostrem describes a current source array for current steering DACs. U.S. Patent 6,545,622 to Kamal et al discloses an equalizer for a current mode DAC.

U.S. Patent 6,507,304 to Lorenz provides a segmented current steering DAC. U.S. Patent 6,310,569 to Chaudhry et al shows a switching scheme for current-mode DACs. U.S. Patent 5,625,357 to Cabler provides a current steering reconstruction filter for a DAC. U.S. Patent 5,521,946 to Main applies a multi-phase clock [114] to parallel DACs [108-1/108-M]. WO 96/25,793 to Cabler provides a combination DAC and FIR filter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick G. Wamsley whose telephone number is (571) 272-1814. The official facsimile number is (571) 273-8300. An alternate facsimile number, (571) 273-1814, should only be used for unofficial documents.

Patrick G. Wamsley

December 19, 2005